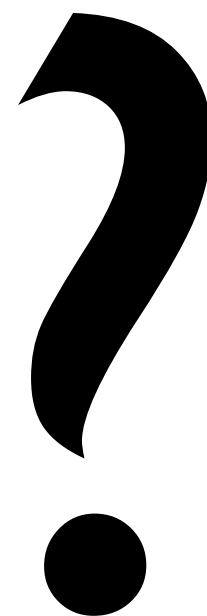
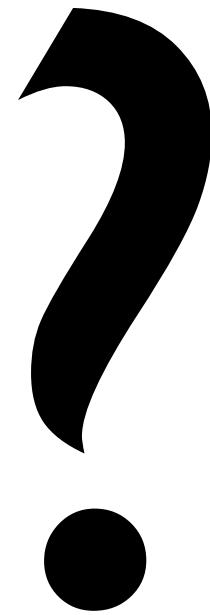


Software Mechanics

Michael Feathers





(what I wish I knew at the beginning of my career)

Software Is Biological



**There is no Up or Down in
Software**



Everything is an Object

I've Got Your "if" Right Here..

```
boolVal ifTrue:[Transcript show:'true']  
      ifFalse:[Transcript show:'false']
```

```
False>>ifTrue: trueBlock ifFalse: falseBlock  
      ^falseBlock value
```

```
True>>ifTrue: trueBlock ifFalse; falseBlock  
      ^trueBlock value
```

A Type is a Set of Values

$\text{int} = \{ x \mid -2,147,483,648 \leq x \leq +2,147,483,647 \}$

```
interface Port {  
    int read();  
    boolean checkStatus();  
}
```

Types and Tests are the
Same Thing

Java - Next/src/VideoEvent.java - Eclipse - /Users/michaelfeathers/Desktop/sc2011/java/Workspace

Package Explorer JUnit

Finished after 0.091 seconds

Runs: 9/9 Errors: 6 Failures: 0

VideoEventTest [Runner: JUnit 4] (0.0)

- canIndicateThatItsTitleContains...
- canIndicateThatItsTitleDoesNotC...
- RecorderTest [Runner: JUnit 4] (0.0)
- TimeSlotTest [Runner: JUnit 4] (0.0)

Failure Trace

java.lang.Error: Unresolved compilation problem: Syntax error, insert ";" to complete FieldDeclaration
In type for the method is missing
method getTitle() is undefined for th...

at VideoEvent.<init>(VideoEvent.java:10)
at VideoEventTest.dropBear(VideoEventTest.java:10)
at VideoEventTest.canIndicateThatItsTitleContains...

VideoEvent.java

```
public class VideoEvent {  
  
    private String title;  
    private boolean willBeRecorded;  
  
    public VideoEvent(String title, TimeSlot timeSlot) {  
        this.title = title;  
        this.willBeRecorded = false;  
    }  
  
    public String getTitle() {  
        return title;  
    }  
}
```

Task List

Find All Activate...

Connect Mylyn
Connect to your task and ALM tools.

Outline

VideoEvent

- title : String
- willBeRecorded : boolean
- VideoEvent(String, TimeSlot)

Problems @ Javadoc Declaration Console

7 errors, 51 warnings, 0 others

Description	Resource	Path
Errors (7 items)		
Warnings (51 items)		

Sweetness Is Painful



**You Can't Make Software
Stronger With Redundancy**

N-version programming

From Wikipedia, the free encyclopedia

N-version programming (NVP), also known as **multiversion programming**, is a method or process in [software engineering](#) where multiple functionally equivalent programs are independently generated from the same initial specifications.^[1] The concept of *N*-version programming was introduced in 1977 by Liming Chen and Algirdas Avizienis with the central conjecture that the "independence of programming efforts will greatly reduce the probability of identical software faults occurring in two or more versions of the program".^{[1][2]} The aim of NVP is to improve the reliability of software operation by building in [fault tolerance](#) or [redundancy](#).^[1]

- Researchers have argued that different programming teams can make similar mistakes.^[4] In 1986, Knight & Leveson conducted an experiment to evaluate the assumption of independence in NVP, they found that the assumption of independence of failures in *N*-version programs failed statistically.^{[4][5][6]}

Protection is a Social Problem Not a Technical Problem

javax.mail

Class Session

[java.lang.Object](#)

└ **javax.mail.Session**

```
public final class Session  
extends Object
```

The Session class represents a mail session and is not subclassed. It collects together properties and defaults used by the mail API's. A single default session can be shared by multiple applications on the desktop. Unshared sessions can also be created.

**WARRANTY VOID
IF SEAL DAMAGED**

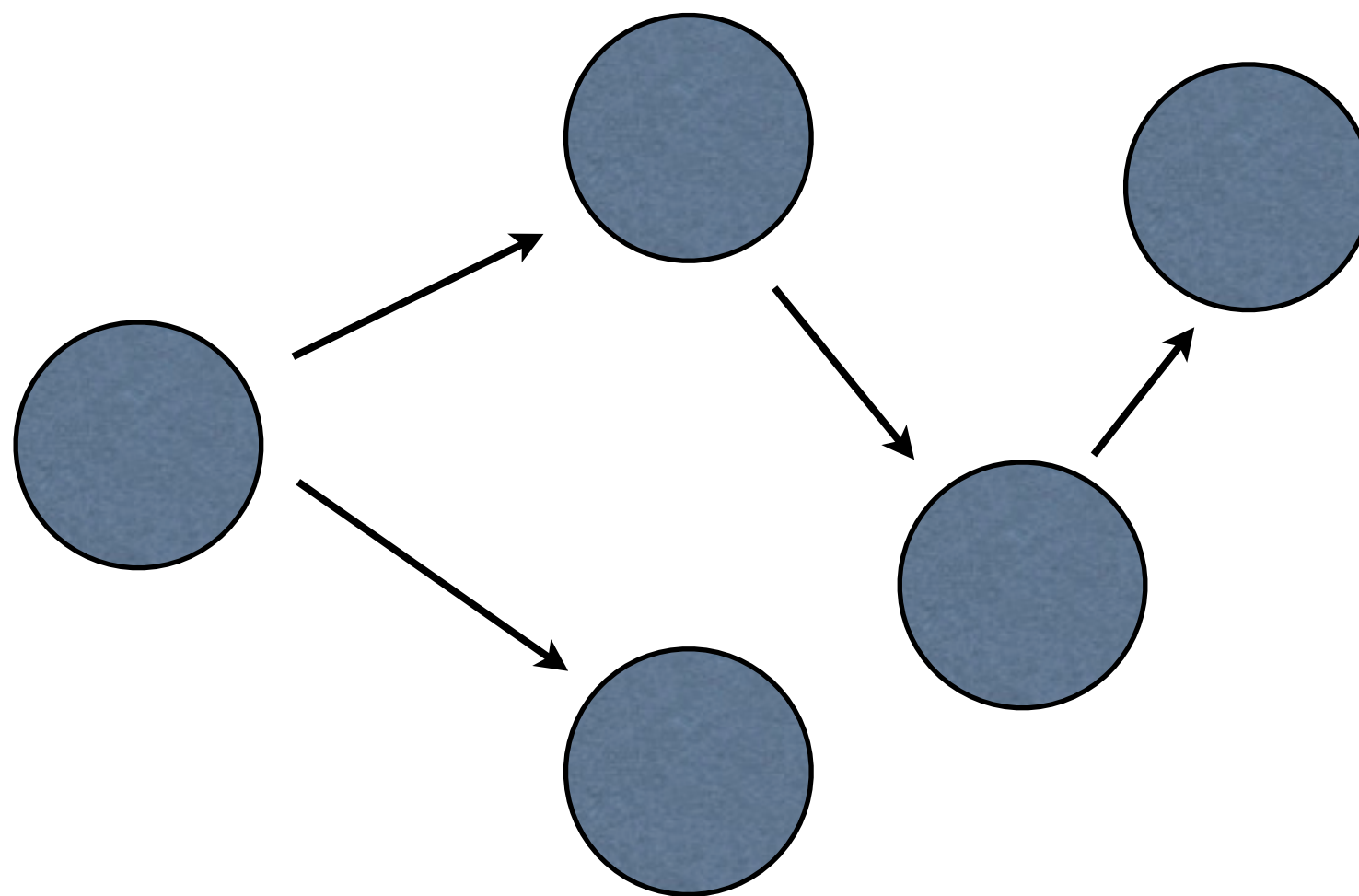
A-12345

COMPANY NAME

**There Are No Requirements
(It's All Design)**



Names Come After Structure



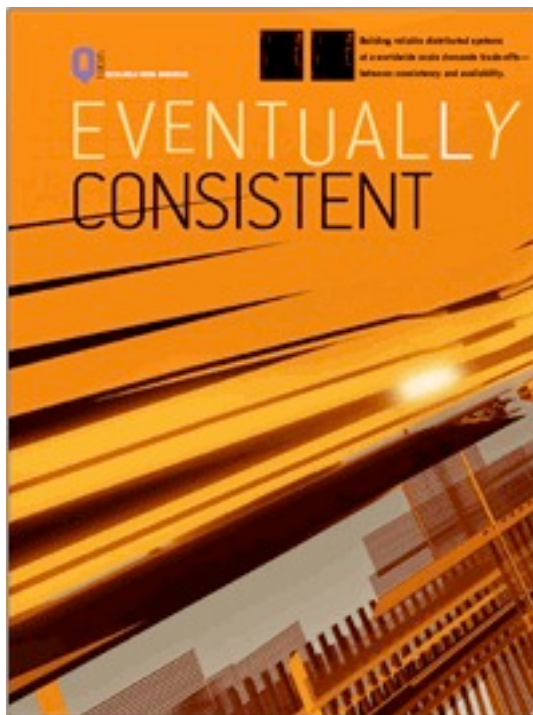


The Physical Shapes The Logical

MapReduce

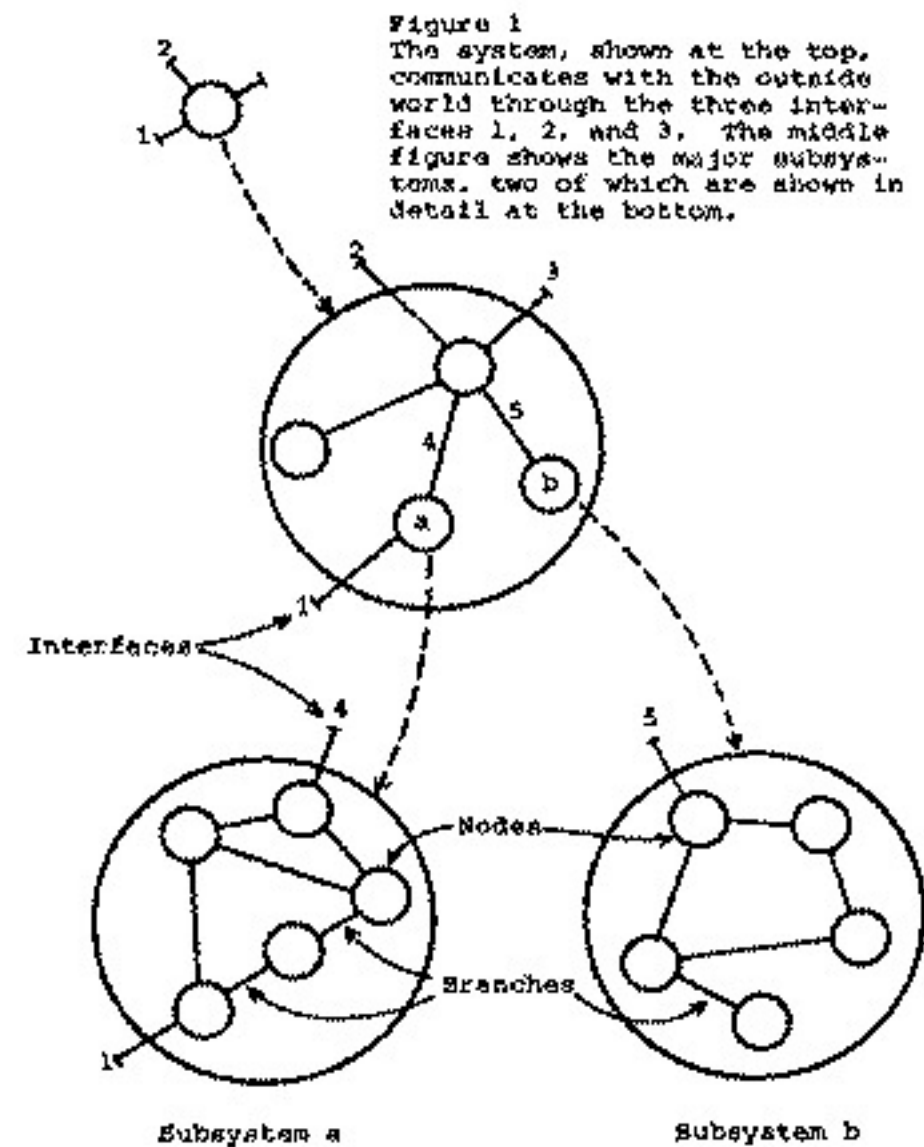
From Wikipedia, the free encyclopedia

MapReduce is a [programming model](#) for processing large data sets, and the name of an implementation of the model by [Google](#). MapReduce is typically used to do [distributed computing](#) on [clusters](#) of computers.^[1]



The Social Shapes Design

Any organization that designs a system will inevitably produce a design whose structure is a copy of the organization's communication structure.



You Can Design Away Errors



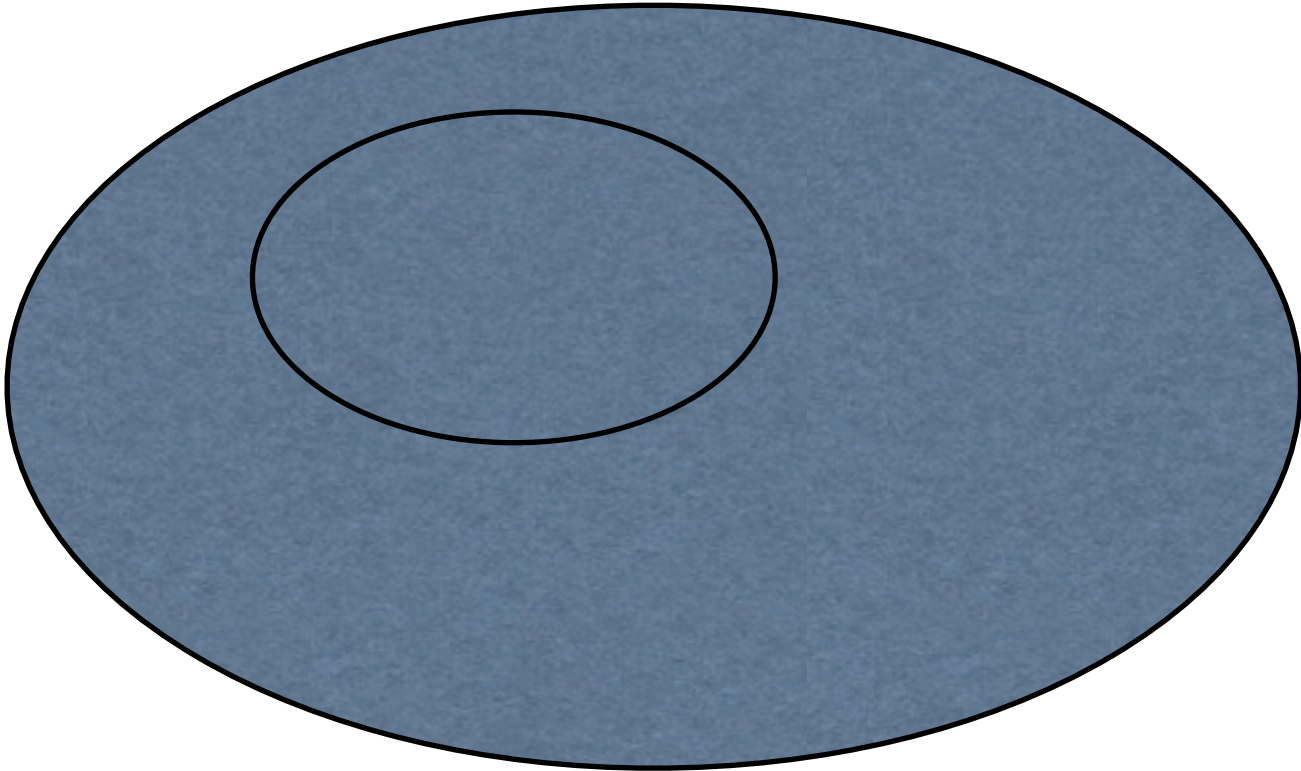
Logging is a Design Failure



Databases are a Design Tool



Globals Hide Design Information



Standards Dampen Design

S T A N D A R D S

Context is King

